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SUBJECT: INVASIVE SPECIES FLOOD TAIWAN RIVERS AND LAKES

¶1. (SBU) SUMMARY. This is an action cable see paragraph 9. Taiwan, an island 160 kilometers off the coast of China, has been home to unique flora and fauna. Distance from the mainland has managed to preserve many of its endemic species from foreign invasion, although that situation is under threat as humans illegally introduce more foreign species. Recent studies show, for example, that out of 51 streams surveyed in Taiwan, 49 harbor invasive species from Southeast Asia, Africa and Latin America. These foreign species are polluting Taiwan's environment and endangering its native species. Public education and enforcement measures both need strengthening to help protect native species. Religious practices are also a major contributor to the demise of endemic species, as the faithful release fish into the environment to garner favor. If uncontrolled, these invasive species could seriously deplete the fragile endemic biodiversity on the island. END SUMMARY

GEOGRAPHICAL FACTORS IN TAIWAN

¶2. (SBU) Taiwan is a mountainous island, with no large rivers and mostly seasonal streams. According to experts, this habitat cannot sustain large fish due to the lack of nutrients in its freshwater bodies. As a result, the fish fauna of about 140 species is restricted to small species which can eke out a living in this limited habitat. An example is the Goby population on the East coast which migrate from the ocean to small mountain streams to mature. Carp, a relatively large fish, was introduced from the mainland, and now is common in lowland ponds and streams. Experts have pointed out that, unlike the mainland, Taiwan does not have well-established habitats for its native species, a situation that invites foreign species to come in and take over. Of 51 streams surveyed in a recent study commissioned by the Council for Agriculture, only two streams in Taiwan were found not to have invasive species, and both were located in mountainous areas. The study also found that higher-altitude streams harbored fewer invasive species due to lower temperatures and the scarcity of food.

SNAKEHEADS AND PIRANHA IN THE LAKES

¶3. (SBU) The diversity of foreign species in Taiwan freshwater is truly astonishing, ranging from Pirarucu and Piranha native to the Amazon river in Brazil to Sweetfish (*Plecoglossus altivelis*) from Japan. Although there is no proof that the large Pirarucu (*Arapaima gigas*) is breeding in Taiwan's water bodies, the warm water habitats provided by dams and lakes have already bred numbers of piranha and snakeheads. Of these species the snakehead (*Channa striata*) from Southeast Asia is the most aggressive and voracious. It has no natural enemies, and feeds at night, often crawling on

land from one water body to another. It has also spread from dams to lakes to ponds, has been feeding on ducks and other waterfowl, and will not hesitate to bite when threatened. There have been suggestions from the authorities to encourage public consumption of the snakehead as a means of controlling it. However, this has the potential of encouraging the breeding of this fish if it becomes a popular food. The other so-called pest fish is the ubiquitous Pipa Mousefish (*Pterygoplichthys multiradiatus*), named because its body resembles the pipa, a musical instrument. It is a bottom feeder that routinely is kept in aquariums to clean the algae from the tank. Since its introduction from Brazil before 1978, it has found its way into multiple lakes, ponds and streams. Because it can survive in polluted environments and does not have natural enemies, it has thrived unmolested.

RELIGIOUS PRACTICES DETRIMENTAL TO NATIVE SPECIES

14. (SBU) ESTH officer spoke with professor Chen I-shiung, a recognized expert on freshwater fish at the National Ocean University in Keelung, about the root causes of foreign invasive species. Chen said that as a subtropical island, Taiwan can easily accommodate these interlopers (who are mostly from tropical areas)--but at the expense of native species. Because foreign species have not developed predators yet, they can multiply with impunity and deplete the native species rapidly. Chen said the public has a poor understanding of the effect of releasing aquarium fish into the environment. This is compounded by the Buddhist religious practice of releasing animals into the wild. Many religious groups believe that by releasing animals, they are gathering goodwill in the heavens. To bridge that religious

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gap is going to take a strong public education effort which the authorities are not prepared to fund.

TILAPIA: THE MOST COMMON TAIWAN FISH?

15. (SBU) The most common, if not the earliest, fish introduced into Taiwan was the Tilapia, native to Mozambique. It was introduced in 1946 and today can be found today in virtually every body of water on the island. Tilapia reproduce quickly, can live in lakes up to 700 meters above sea level and have a long dorsal fin which makes them difficult to swallow by other fish. They have become so ingrained in the local cuisine that Tilapia fillets are routinely served as fish fillets in restaurants, and locals even think it is a native fish. One example of the adaptability of foreign species is Tsuifeng Lake at 1,840 meters altitude. Whereas the lake did not traditionally have any fish, it now brims with ornamental carp, released mostly by religious groups. The worst-hit is Lake Cheng-ching in Kaohsiung where Pirarucu, Piranha coexist with snakeheads and Wuchang bream (*Megalobrama amblycephala*), driving native species to the verge of extinction.

WILL THE ICE-AGE RELIC SURVIVE?

16. (SBU) The endangered Cherry Blossom Salmon (*Onchorhynchus Masou Formosanum*), a relic of the Ice Age brought back from the brink of extinction through the efforts of concerned officials, is struggling to survive in its final remaining habitat: 5 km of stream in central Taiwan. Professor Chen said that species is being bred to the point of extinction, since scientists release thousands of fish fry every season into the only stream where it is found. Since its natural habitat can only sustain a small population of a few hundred, the massive release of fish fry could potentially weaken the gene pool. Despite media reports heralding the successful breeding of this species, it is confined to only one stream, and without an alternative habitat it could easily become

extinct if environmental stresses are brought to bear.

TAIWAN'S BIODIVERSITY AT RISK

17. (SBU) Only two streams in Taiwan are free of invasive species, the Hoping River near Ilan and the Fengkang River in Pingtung. They are the exception, because they are fast-flowing and the surrounding area is not suitable for long-term human habitation. Besides a strengthened public education campaign, tougher enforcement is needed to forestall a complete takeover by invasive species. Most critical for the long-term however, is finding new habitats to accommodate Taiwan's threatened endemic species. That is a tall order on this island of 23 million where industrial development has priority over protection of endemic species. At current rates of invasion, it is likely that endemic species will become marginalized from most of their habitats in a few years.

ENFORCEMENT WEAK

18. (SBU) In terms of managing its biodiversity, Taiwan faces two issues, one has to do with public education, the other with enforcement. While changing people's religious beliefs will be difficult, enforcing the law is a good way to begin controlling invasive species. Taiwan's national parks are administered by the Construction and Planning Agency (CPA), which is part of the Ministry of Interior. CPA staff admitted that Taiwan needed something equivalent to the U.S. National Park Service but since the bureaucracy moved slowly no concrete plans were in the works. CPA staff at three different National Parks said they had not been aware of people fined for dumping fish in the streams although there were regulations prohibiting such behavior. They claim that policing is adequate within the park but admit that outside park boundaries enforcement may be lax. What is needed are clear procedures on how to enforce the existing regulations and the equivalent of park rangers who can enforce the law and issue fines to violators. On that score, Taiwan's park administrators and county officials could learn a point or two from their U.S. counterparts.

ACTION FOR OES/ENV

19. (SBU) AIT ESTHOFF learned that Taiwan National Park

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officials would very much like to have an exchange with their U.S. counterparts. CPA is sponsoring a conference on National Parks, Wetlands and Seashore from December 19-20 in Taipei and wished to invite U.S. participants from the National Park system to share experiences in wetlands and park planning and management. AIT will provide conference information including registration, agenda, time and venue when available to OES.

YOUNG